

# The matrix Dyson equation in random matrix theory

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The asymptotic density of states for Wigner matrices is computed by solving a simple quadratic scalar equation for its Stieltjes transform. For random matrices with correlated entries, the corresponding equation becomes a self-consistent matrix equation. We present a comprehensive analysis of this matrix Dyson equation which, in particular, leads to the Wigner-Dyson-Mehta spectral universality for large random matrices with a decaying but otherwise general correlation structure.

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